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Instrumentation '88

Pittsburgh Conference showcases analytical trends in New Orleans

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CHEMICAL & ENGINEERING NEWS

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MARCH 7, 1988

News of the Week

■ **Department of Energy has completed initial steps in its efforts to build a new production reactor for the U.S. nuclear arms program before problems with its current, aging reactors worsen.** **Page 6**

■ **EPA's newly announced plan to protect groundwater from pesticide contamination establishes a framework in which states can tailor control measures to specific, local groundwater needs.** **Page 7**

■ **Marking another new high in a continuing upward trend, foreign companies and inventors won about 47% of the patents awarded in the U.S. last year.** **Page 7**

■ **A new "personal supercomputer" from Ardent Computer combines high computational speed with high-performance graphics.** **Page 8**

■ **Samuel Heyman, chairman of GAF, has raised his bid to take over the company, but GAF's investment adviser is seeking higher bids from other parties.** **Page 8**

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Business

West Germany's chemical industry will continue its steady performance, predicts Helmut Sihler, new head of its industry association. **Page 11**

Fiber Industries, a newly independent company formed from Celanese polyester fibers business, has a running start on success. **Page 13**

Developing countries now account for more than half of man-made fibers output, latest Enka survey shows. **Page 16**

Government

California's toxics law has taken effect and businesses are beginning to feel the impact. **Page 19**

Administration's 1989 budget proposal is a mixed bag for regulatory agencies. **Page 22**

Perkin Medal

James F. Roth is recognized for his outstanding contributions to catalytic chemistry. **Page 24**

Science

National Cancer Institute seeks contract proposals for preparation of radiolabeled materials, literature searching. **Page 25**

People

Roger J. Williams, noted biochemist and past ACS president, is dead at 94. **Page 66**

Instrumentation '88

At the 1988 Pittsburgh Conference in New Orleans, the conference's largest-ever exhibit featured many new lab products and the accompanying scientific sessions focused on advances in analytical methods. **Page 27**

Chemical & Engineering News

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LETTERS

Plastic handguns

SIR: There have been many column inches expended in C&EN letters arguing against ACS members expressing their concerns about various matters in our news magazine (incidentally, one of the best in the business) on the grounds that it is inappropriate—I don't agree, but maybe so. One matter that ACS and all ACS members should be concerned about is plastic handguns. These can pass undetected through x-ray screens. Their only purpose is to kill or maim someone. They, along with plastic explosives, are uniquely possible as the results of the efforts of chemists.

The manufacture and importation of plastic handguns into the U.S. is supported by some gun manufacturers and the National Rifle Association. ACS should go on record as opposing this.

Alan C. Nixon
Berkeley, Calif.

Science teaching

SIR: Letters to the editor frequently point out that the education provided by the public schools leaves much to be desired, particularly in the sciences and math. As a retired scientist I do have time to do something positive. I am certain that others are also able and willing to donate some time in their own areas of expertise.

You can make as large or as small a contribution as your time available allows. Check with your local school principal and ask to meet one of the sixth- or seventh-grade teachers who would like help with a class science topic. My preferred way to help is to work with the teacher to develop an experiment or demonstration that the teacher can perform with the students. It thus becomes part of the teacher's continuing program that can be used year after year.

Once in a while I work directly with three or four students at a time on a new topic or demonstration to see what kinds of questions will need to have answers. I work only with the thought that the teacher will take the project over. This way I can go from teacher to teacher and project to project. The work is stimulating and I meet lots of interesting teachers and students.

It is important that the teacher initiate the request. I have found that my favorite projects often are of no interest to the teacher, so I just set them aside hoping some day they may be revived.

Occasionally, teachers want help in an area where I am not comfortable. When this happens, I look around among my friends and arrange for one of them to participate in the program.

If you get involved, be prepared for the following types of questions: What does a scientist do? What was your toughest course in school? Is math really important?

Don H. Anderson
Sequim, Wash.

Moissan celebrative volume

SIR: William B. Jensen, who reviewed "Fluorine: The First Hundred Years (1886–1986)" for you recently (C&EN, Nov. 30, 1987, page 28) was mistaken when he stated that the book comprises papers read at the Moissan centennial symposium held in Paris in August 1986. In fact, publication of the book, which was on sale at the symposium from the very first day, was a completely independent venture; and the objective, as stated in the preface, was both to present a history of the development of fluorine chemistry up to the end of World War II and to provide an up-to-date account of the subject from academic and technological viewpoints. Professor Jensen's query about the origin of the 13 appendixes in chapter 11 is easily answered: They were commissioned from well-known experts to provide truly authoritative information on aspects deemed to be specially important. Note that abstracts only of papers actually read at the Moissan symposium have been published in the *Journal of Fluorine Chemistry* [35, 3 (1987)].

R. E. Banks, *Manchester, U.K.*
D. W. A. Sharp, *Glasgow, U.K.*
J. C. Tatlow, *Birmingham, U.K.*

The new doctorate

SIR: Not to disparage the contributions of non-Ph.D. chemists, I would submit that Mario Altamura's suggestion (C&EN, Nov. 23, 1987, page 2) of a doctorate in chemical research would indeed do much to honor such persons. I would point out, however, that the doctorate carries with it the implication that the recipient not only can do original work but is willing to sacrifice nearly everything for it: six to eight years of practically uncompensated labor, if one counts the obligatory postdoc years; far more than 40 hours most weeks; and a near total lack of family life. Why create confusion by starting a new "doctorate"? For a similar contribution, anyone can have the real thing.

Robert M. Kuhn
Santa Barbara, Calif.

Developing nations lead man-made fibers output

Sooner or later it was bound to happen, and last year saw fulfillment of the expectation. For the first time, more than half of the global production of man-made fibers, and half of the synthetics, came from countries other than Japan, the U.S., and Western Europe together.

On a geographical breakdown, the U.S. now accounts for about 21% of the output of man-made fibers, Western Europe 18%, Japan 10%, and other countries—largely comprising China and those of Southeast Asia—the 51% balance. The synthetic fibers split is similar, with the U.S. having a 23% share, Western Europe 18%, Japan 9%, and the others 50%.

The data compiled by market analysts at Enka, the fibers arm of Akzo of the Netherlands, in their latest annual review of the world fibers scene, point up the shifting trend that has been taking place. Ten years ago, in contrast, countries other than Japan, the U.S., and those of Western Europe accounted for less than 35% of man-made fibers, and less than 30% of synthetic fibers.

Overall, last year saw continuation in global fibers' growth. The 39.89 billion lb produced was an all-time high. The 7% increase over 1986, one of the highest annual advances of the past decade, was helped by continued growth of textiles and clothing, and an upswing in the automotive trade, which in turn called for more tire cord to supply the original equipment and replacement tire demand. Production of synthetics—essentially acrylic, the nylons, or polyamides, and polyester fibers—which accounted for 82% at 32.65 billion lb, was up 8%.

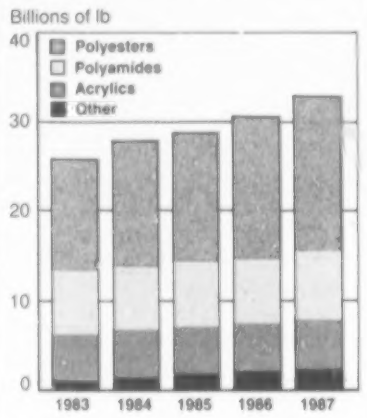
The 7.24 billion lb of the cellulosic fibers—rayon, and the cellulose acetates—although nearly 3% ahead of 1986, came to only 18% of the total, down from 19% the previous year. Indeed, over the past 10 years, production of cellulosics has undergone a 1% or so average yearly decline from the 7.82 billion lb in 1977, whereas that of the synthetics grew nearly 5% a year from 20.47 billion lb.

The Enka review makes the point that the 6% growth in cellulosics was entirely accounted for by the "other countries," where almost 60% of all cellulosic fibers now are made. The "western" industrial countries showed a slight decline. Moreover, staple was the only cellulosic fiber for which there was an increase, shifting gradually to the "others," to India and Indonesia in particular; filament showed a slight drop. "The persistently high demand for [cellulosic] filament yarn could not be met for all textile sectors," the study notes.

Output of man-made fibers in the U.S. advanced 6% from 1986 to 8.51 billion lb, reflecting improved domestic demand due to the persistently strong textiles market. In addition, exports benefited from the fall of the dollar's exchange rate against major world currencies. The result was a substantially higher use of capacity.

In Western Europe, however, man-made fibers production moved marginally down to 7.11 billion lb. In Japan, it slipped more than 1% to 3.78 billion lb, largely because of a fall in exports, and a rise in textiles and clothing imports. Competition with Japan's neighboring Southeast Asian countries intensified. Rest-of-the-world production was up a sizable 12% to 20.5 billion lb. As for

Polyester fibers continue to dominate output



Source: Enka

Man-made fibers output reaches all-time high . . .

Billions of lb (% change from previous year)	1987	1986	1985	1984	1983	1977
U.S.	8.51 (6.2%)	8.01 (3.4%)	7.75 (−2.1%)	7.92 (−1.5%)	8.04 (−15.5%)	8.07 (10.2%)
Western Europe	7.11 (−0.1)	7.12 (−1.7)	7.24 (2.3)	7.08 (5.2)	6.73 (5.8)	6.88 (−4.5)
Japan	3.78 (−1.3)	3.83 (−3.8)	3.98 (0)	3.98 (2.6)	3.88 (1.6)	3.77 (5.9)
Other	20.49 (11.7)	18.35 (8.8)	16.87 (8.3)	15.57 (12.3)	13.87 (6.4)	9.77 (9.1)
TOTAL	**39.89 (6.9%)**	**37.31 (4.1%)**	**35.84 (3.7%)**	**34.55 (6.2%)**	**32.52 (7.8%)**	**28.29 (5.5%)**

. . . mainly as a result of growth of synthetics

U.S.	7.51 (7.3%)	7.00 (2.8%)	6.81 (−1.3%)	6.90 (−1.4%)	7.00 (17.3%)	6.86 (11.0%)
Western Europe	5.82 (0.3)	5.80 (−0.9)	5.85 (5.6)	5.54 (6.5)	5.20 (8.3)	4.76 (−6.0)
Japan	3.02 (−0.7)	3.04 (−2.9)	3.13 (2.3)	3.06 (3.7)	2.95 (1.4)	2.85 (6.0)
Other	16.30 (13.2)	14.40 (11.0)	12.97 (10.3)	11.76 (15.1)	10.22 (9.5)	5.99 (14.1)
TOTAL	**32.65 (8.0%)**	**30.24 (5.1%)**	**28.76 (5.5%)**	**27.26 (7.4%)**	**25.37 (10.3%)**	**20.46 (6.7%)**

Source: Enka

annual change during the recent 10 years, that for the U.S. at less than 1% just about equaled Western Europe's, Japan showed essentially no movement, and the other countries had a gain of nearly 8%.

Among the synthetic fibers, 57% of last year's global total production consisted of staple fiber, 43% was filament yarn. The split was the same as in 1986, but differed from 10 years ago when about equal quantities of the two forms were made.

The 7.51 billion lb of synthetic fibers made in the U.S. was an improvement of more than 7% on 1986. Europe's 5.82 billion lb was only slightly up on 1986, and still below 1985's quantity. Japan retreated for a second consecutive year to 3.02 billion lb, nearly 1% down from 1986. The other countries registered a solid 13% growth to 16.3 billion lb. Viewed over a 10-year span, production in the U.S. grew barely 1% a year, but did better than Japan's 0.6% rate. That of Western Europe, a more respectable 2%, was far outpaced by the other countries' more than 10% yearly increase in output.

Among the synthetics, polyester fibers continue to pull ahead of the rest. At 16.98 billion lb last year, they made up 52% of the total production against their 51% (15.43 billion lb) 1986 share, and 46% (9.41 billion lb) in 1977. The nylons, at 25% (8.16 billion lb in 1987), are next in volume importance, but their slice of the total has been moving down over the years. In 1977, for example, their share stood at 31% (6.34 billion lb) of synthetics made that year.

Likewise the acrylics, which last year made up 17% (5.55 billion lb) of the total, have been losing ground, but not to the same extent. Their 1977 share was 19% (3.89 billion lb).

Other synthetic fibers, mainly the elastomerics and those based on polypropylene and polyvinyl chloride, made up the 6% 1987 balance at 1.96 billion lb. In 1977, these held a 4% (820,000 lb) niche.

The U.S. continues to hold the lead in nylon and polyester fibers production among the western industrialized countries. In fact, its 34% share (2.77 billion lb) of world nylons output is up from the 22% share (1.39 billion lb) in 1977. But Western Europe's moved down to 17% (1.39 billion lb) from 34% (2.16 billion lb), and Japan's to 7% (570 million lb) from 11% (700 million lb) in the same period. Other countries had the 42% (3.43 billion lb) balance of nylon production, compared with the 33% (2.09 billion lb) they could claim in 1977.

As for polyester fiber, last year's production breakdown was 21% (3.57 billion lb) in the U.S., 11% (1.87 billion lb) in Western Europe, 8% (1.36 billion lb) in Japan, and 60% (10.19 billion lb) in the rest of the world, helped to a large extent by expansions in China and Taiwan. The 1977 production profile was 39% (3.67 billion lb) for the U.S., 17% (1.60 billion lb) for Western Europe, 13% (1.22 billion lb) for Japan, and 31% (2.92 billion lb) for the remainder.

In acrylic fibers, the U.S. is at the bottom of the league with 11% (610 million lb) last year, compared with 32% (1.78 billion lb) for Western Europe, 16% (890 million lb) for Japan, and 41% (2.28 billion lb) shared throughout the rest of the world. Ten years ago, the U.S. and Japan tied at 17% (660 million lb) behind Western Europe's 36% (1.40 billion lb), and the other countries' 30% (1.17 billion lb).

Regarding the current year, the Enka analysts confine their outlook to the West European scene. They foresee a slackening in automotive sales, which in turn will impact on tire sales, especially original-equipment tires. And the "slight increase" expected in the demand for textiles and clothing "may primarily benefit imports." Although Western Europe's domestic demand for the man-made fibers industry "may firm up slightly, export conditions will continue to be poor," they believe.

Dermot O'Sullivan, London

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plant in Carson, Calif., that produces detergent products, will be affected by Proposition 65 at this time, Bartolanzo says. The facility uses benzene, one of the 29 chemicals now covered by the law, and emits small amounts of the chemical. At the facility's fence line, the concentration in the air is on the order of 30 ppb, she says, which is well below the workplace standard of 1 ppm.

Nevertheless, "erring on the side of caution," Monsanto is posting warning signs around the perimeter of the Carson plant, Bartolanzo says. The company is also placing advertisements in several local newspapers that state that small amounts of benzene are emitted by the facility while stressing that the emissions meet or are below permitted levels.

New groups of chemicals will fall under Proposition 65's warning provision each quarter beginning in July. On Oct. 27 this year, the law's provision prohibiting discharge of listed chemicals into drinking water will take effect for the first group of 29 chemicals. The regulations governing that aspect of Proposition 65 are still being formulated. □

EPA's regulatory budget is up 10% . . .

$ Millions	1989[a]	1988[a]	1987[b]	% change 1988–89
Superfund	$1632.4	$1440.3	$ 987.6	13%
Hazardous waste	161.1	156.0	152.2	3
Water quality	146.1	146.8	165.6	0
Air	119.2	115.7	124.2	3
Pesticides	85.7	35.0	25.6	145
Drinking water	54.0	59.1	57.6	−9
Leaking underground storage tanks	50.0	39.4	20.3	27
Toxic substances	41.3	77.5	75.2	−47
Interdisciplinary	9.6	9.4	6.3	2
Radiation	7.2	7.9	4.0	−9
TOTAL	$2306.6	$2087.1	$1618.6	10%

. . . OSHA's just 4% . . .

$ Millions	1989[a]	1988[a]	1987[b]	% change 1988–89
Enforcement	$150.3	$150.5	$146.5	5%
Federal	117.0	110.0	86.7	6
State	41.3	40.5	59.8	2
Compliance assistance	36.1	35.3	35.0	2
Safety and health	26.9	26.5	24.1	1
Statistics	20.2	20.0	17.4	1
Standards	6.7	6.5	6.5	3
Technical support	17.5	16.6	16.4	5
Administration	6.0	5.8	6.0	3
TOTAL	$244.8	$234.7	$228.0	4%

. . . and FDA's down 2%

$ Millions	1989[a]	1988[a]	1987[b]	% change 1988–89
Drugs	$174.7	$194.0	$176.5	−10%
Foods	132.3	126.4	120.4	5
Devices and radiological products	77.8	74.9	71.0	4
Program management	57.2	56.5	54.1	1
National Center for Toxicological Research	25.0	24.3	23.0	3
TOTAL	$467.0	$476.1	$445.0	−2

Note: Obligations. a Estimates. b Actual. Source: Office of Management & Budget

Regulatory agencies' '89 budget a mixed bag

The fiscal 1989 budget proposal that President Reagan presented to Congress late last month is a mixed bag for the regulatory agencies that, in one way or another, interact with the chemical industry.

For instance, the Environmental Protection Agency's regulatory budget is up 10%, or $220 million, to $2.3 billion, following an almost 30% gain for the current fiscal year. But that doesn't mean increases for every program. For example, funding for the toxic substances program has been cut almost in half to $41 million. The largest portion of the reduction, according to the agency, reflects a decision not to request any more money for removing asbestos from school buildings. EPA notes that the federal government has already provided more than $150 million to fund abatement projects that have greatly reduced the problem. Any further activities, it says, should be the responsibility of state and local governments.

Funding for drinking water programs is down almost 10% to $54 million. Still EPA says that in fiscal 1989 it will promulgate standards for 34 toxic chemicals and radionuclides, including radon, the last of the 83 contaminants specified in the Safe Drinking Water Act Amendments of 1986.

In sharp contrast is the pesticides program budget, which is soaring by more than $50 million to reach a total of $86 million. All of the increase, however, will go to fund the transportation, storage, and disposal of canceled and suspended pesticides. That activity is currently funded at $8.4 million. According to EPA, the large increases in 1989 will enable it to make significant progress on final disposal of dinoseb and 2,4,5-T/Silvex.

In the legal area, EPA's enforcement budget is up 7% to $299 million, and funding for the Justice Department's environmental enforcement activities is up 23% to $32 million. Funding for the antitrust division is up 12% to $294 million.

The Occupational Safety & Health Administration's budget, on the other hand is up just 4% to $245 million, following a 3% increase this year. OSHA says it will issue seven health standards in fiscal 1989, up from six this year; increase its number of inspections from 62,200 to 66,500; and issue eight safety standards, double the number planned in the current fiscal year.

The Food & Drug Administration's budget is falling 2% to $467 million, following a 7% increase for fiscal 1988. Hardest hit are FDA's drug activities. That budget account is down 10% to $175 million, at a time when the agency is under pressure to expedite the approval of new drugs, particularly ones developed to combat acquired immune deficiency syndrome.

Janice Long, Washington